

Claims

I claim:

1. A stamp or label between whose opposing major surfaces is mounted a thin radio frequency identification (RFID) package operative for transmitting and receiving RF identification signals.

2. The invention defined in claim 1 wherein said RFID package is electrically powered by one or more thin flat battery cells, such as ones made of lithium/vanadium-oxide/copper, and connected to a thin integrated circuit transceiver chip to which a planar antenna is RF coupled.

3. A postage stamp or shipping label having first and second spaced apart facing major surfaces between which is mounted a radio frequency identification (RFID) system operative to store identifying data therein representative of an article being mailed or shipped and to which the stamp or label is affixed, and said RFID system being operative to receive RF signals and store data therein and further being operative to transmit this data by way of RF signals which are transmitted to an interrogator upon request at the point of article mailing or shipment, points along a given shipment route, and upon reaching a point of destination.

4. The stamp or label defined in claim 3 wherein said RFID system includes an integrated circuit chip having therein an RF transmitter, an RF receiver, a memory stage and a control logic; a thin flat battery connected to said IC chip; and a thin RF antenna disposed adjacent to said battery and IC chip and operative to transmit and receive RF signals and couple said RF signals to and from said RF chip during the interrogation thereof.

5. The invention defined in claim 4 wherein said integrated circuit transceiver and said thin flat battery are mounted in side-by-side configuration on an underlying base material disposed on one of said facing major surfaces of said stamp or label.

6. The invention defined in claim 5 wherein said thin RF antenna includes one or more thin metal strips mounted on said base material and connected to one or more terminals, respectively, on said IC chip for providing both RF transmission from and reception to said IC transceiver chip.

7. The invention defined in claim 6 wherein said antenna is defined by said battery or a ground plane.

8. The invention defined in claim 6 wherein said thin film battery includes a lithium anode layer and a conductive collector layer separated by a polymerized cathode electrolyte and separator layer.

9. The invention defined in claim 8 wherein said cathode layer contains an oxide of vanadium or magnesium.

10. The invention defined in claim 4 wherein the thickness of said thin flat battery is within the range of 1 - 10 mils, and may be small as a fraction of a mil.

11. The invention defined in claim 9 wherein the thickness of said thin flat battery is within the range of 1 - 10 mils, and may be small as a fraction of a mil.

12. The invention defined in claim 4 wherein said RFID IC chip is replaced with an electro-optical light operated IC chip and operated to propagate light of a given wavelength to an interrogator while also being powered by one or more thin flat battery cells less than 10 mils in thickness.

13. A process for manufacturing either a postage stamp or mailing or shipping label which is operative in either an RF signal or light signal communication mode which includes depositing one or more thin flat battery cells and an integrated circuit (IC) chip between base and cover members of said stamp or label and connecting said one or more of said thin flat battery cells to power said IC chip.

14. The process defined in claim 13 wherein said cells and said IC chip are formed to thicknesses less than 30 mils.

15. The process defined in claim 14 which includes constructing said IC chip as an RF transceiver and connecting a thin film antenna to said IC chip.

16. The process defined in claim 15 wherein said base and cover members of said stamp or label are initially formed of one piece construction and are then folded one upon another after said cells, IC chip, and antenna have been deposited on one of said base or cover members.

17. The process defined in claim 16 wherein said thin flat battery cells are constructed of lithium, polymerized vanadium-oxide, electrolyte, and copper.

18. The process defined in claim 17 wherein said cell thickness is formed so as not to exceed a fraction of a mil.

19. The invention defined in claim 18 which includes forming receiver, transmitter, control logic, and memory stages on said IC chip.

20. The invention defined in claim 13 which includes forming an electro-optically light operated source on said IC chip as an alternative to RF communication.

21. The invention defined in claim 13 which includes forming an optical detector on said IC chip as a means of receiving and detecting signals carried by light.

22. The invention defined in claim 13 which includes forming an optical detector on said IC chip as a means of powering said RFID transceiver as an alternative to using a battery.